HW1 is 1.3, 1.10, 1.19, 1.20, 1.27.

1.3. Generate 100 observations from an autoregressive model.

Suppose we want to simulate $x_t = 0.7\, x_{t-1} + 0.6\, x_{t-2} + w_t$, where $\sigma^2 = v(w_t)=1$.

And suppose we want to MA filter it generating

$y_t = 0.5\, x_{t-1} + 0.25\, x_{t-2} + 0.25\, x_{t-3}$.

```
w = rnorm(150,0,1)
x = filter(w, filter=c(0.7,0.6), method="recursive")[-(1:50)]
y = filter(x, c(0.5,0.25,0.25), sides = 1)
plot.ts(x)
lines(y,lty=2)
```

1.10. Show the MSE is minimized when $A = \rho(l)$.

How do you show something is minimized?

1.19. Find the true autocovariance function of

$$x_t = \mu + w_t + \theta w_{t-1}.$$

$\gamma(h) = cov(x_t, x_{t+h})$. See p17 for an example.

1.20. Simulate a process and find the sample acf. Use the R function acf(). See p29 for an example.

1.27. Suppose a process x_t is stationary with mean μ and autocovariance $\gamma(h)$. What is $E(x_t^2)$? What is $E(x_{t+h}^2)$?